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**Article**

## Monetary policy regimes, the gold standard, and the great depression

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<sup>32</sup> Acemoglu and R. Shimer, "Efficient Unemployment Insurance," *NBER Working Paper No. 6686*, August 1999.

<sup>33</sup> H. Grossman and M. Kim, "Educational Policy: Egalitarian or Elitist," presented at the *NBER Summer Institute*, 1998.

<sup>34</sup> R. Aiyagari, J. Greenwood, and N. Guner, "On the State of the Union," forthcoming, *Journal of Political Economy*.

<sup>35</sup> D. Chen and M. Kremer, "Income Distribution Dynamics with Endogenous Fertility," presented at the *NBER Summer Institute*, 1999.

<sup>36</sup> R. Cooper and A. Jobri, "Learning by Doing and Aggregate Fluctuations," *NBER Working Paper No. 6898*, January 1999.

<sup>37</sup> *Econometric Forecasting*, edited by F. X. Diebold and M. W. Watson, and

*Forecasting and Empirical Methods in Macroeconomics and Finance*, edited by Diebold and K. D. West.

<sup>38</sup> *Review of Economics and Statistics*, edited by Diebold, J. H. Stock, and West, and *Journal of Econometrics*, edited by Diebold and West.

<sup>39</sup> C. A. Sims and T. Zha, "Bayesian Methods for Dynamic Multivariate Models."

<sup>40</sup> R. G. King and Watson, "The Solution of Singular Linear Difference Equations under Rational Expectations."

<sup>41</sup> West and M. W. McCracken, "Regression-Based Tests of Predictive Ability," *NBER Technical Working Paper No. 226*, March 1998.

<sup>42</sup> Diebold, T. A. Gunther, and A. S. Tay, "Evaluating Density Forecasts, with Applications to Financial Risk Management,"

*NBER Technical Working Paper No. 215*, October 1997.

<sup>43</sup> T. G. Anderson and T. Bollerslev, "Answering the Skeptics: Yes, Standard Volatility Models Do Provide Accurate Forecasts," *NBER Working Paper No. 6023*, April 1997.

<sup>44</sup> A. Imrohoroglu, A. Merlo, and P. Rupert, "The Political Economy of Income Redistribution and Crime."

<sup>45</sup> E. Prescott and S. Parente, "Monopoly Rights: A Barrier to Riches."

<sup>46</sup> S. Parente, R. Rogerson, and R. Wright, "Homework in Development Economics."

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## Research Summaries

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### Monetary Policy Regimes, the Gold Standard, and the Great Depression

Michael D. Bordo\*

My research over the past decade has largely focused on three related themes: monetary policy regimes in history; the gold standard as a rule; and the Great Depression. In this article, I discuss all three.

#### Monetary Policy Regimes in History

Historically, two types of monetary regimes have prevailed: one based on the convertibility of domestic currency into specie (gold and or silver),

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prevalent until 1971, and the other based on fiat, which has since become the norm. My research, however, focuses on the domestic and international aspects of four monetary regimes: the classical gold standard (1880–1914); the interwar gold exchange standard (1925–39); the Bretton Woods international monetary system (1944–71); and the present system of managed float.<sup>1</sup>

In the last quarter of the nineteenth century, most countries abandoned silver and paper standards in favor of gold. Under the convertibility principle, governments attached the highest priority to maintaining the fixed price of their currency in terms of specie.

During the twentieth century, though, the convertibility principle's importance declined steadily, clashing with the increasingly accepted

goal of domestic macro stability.<sup>2</sup> The techniques and doctrine of monetary policies developed under the gold standard proved insufficient for achieving economic stability during the interwar period, setting the stage for the Great Depression. Although the adjustable-peg exchange-rate system that arose from the Bretton Woods talks maintained an indirect link with gold, the convertibility principle was abandoned after World War II and replaced worldwide by the goal of full employment. That goal, combined with the legacy from the interwar period of inadequate policy tools and theory, set the stage for the managed float and the Great Inflation of the 1970s. That experience convinced monetary authorities in many countries to re-emphasize the goal of low inflation and to commit themselves to convertibility-rule-like behavior.

Evidence on macro performance in successive monetary regimes shows that inflation was lowest and most stable under convertible regimes (the gold standard and the Bretton Woods convertible regimes of 1959–71). Inflation was less persistent under convertible, as compared with fiat, regimes. The price level tended to be trend-stationary in convertible regimes and difference-stationary in fiat regimes.<sup>3</sup> Also, the performance of real output (both in terms of the growth rate and the standard deviation of growth) was better in the post-World War II period than in the preceding 60 years. This could reflect the fact that both supply (permanent) and demand (temporary) shocks were larger in the pre-World War II regimes.<sup>4</sup>

## The Gold Standard as a Rule

Many of my papers have dealt with the gold standard primarily as a rule or a commitment mechanism, thus shedding new light on gold standard history.<sup>5</sup> Adherence to a fixed price of domestic currency in terms of gold of course serves as a rule or commitment mechanism. It prevents monetary and fiscal authorities from following otherwise time-inconsistent policies.<sup>6</sup> The gold standard rule is also a contingent one: in the event of a well-understood emergency, such as a war, the authorities can temporarily suspend convertibility, issue fiat money to finance their expenditures, and sell debt. They understand that the debt will eventually be paid off in gold or in undepreciated paper. The public also understands that the suspension lasts only for the duration of the wartime emergency, plus some period of adjustment. Afterwards the government will adopt the deflationary policies necessary to resume convertibility at the original parity.

The gold standard contingent rule worked successfully for the core

countries of the classical gold standard: the United Kingdom, France, and the United States. This was also true for the smaller countries of Western Europe and the British Dominions, but not for the peripheral nations of Southern and Eastern Europe and Latin America. Their experience was characterized by frequent suspensions of convertibility and devaluations.<sup>7</sup> Inflation rates, money growth rates, and fiscal deficits echo this difference in performance across countries.

Still, adherence to the gold standard rule was important to peripheral countries despite their lapses because it influenced the terms at which they could have access to the capital essential to their development from the financial centers of metropolitan Europe. The gold standard thus was a “Good Housekeeping Seal of Approval.” Adherence was a signal to lenders that the borrowers followed the path of financial rectitude. Hugh Rockoff and I<sup>8</sup> found strong evidence for this hypothesis: we showed that peripheral countries were charged lower interest rates in London on gold-denominated bonds if they were faithful adherents to the gold standard. Moreover, we found a ranking from low to high of the risk premiums charged: countries that had never suspended convertibility were at the top; countries that never adhered were at the bottom; and countries that temporarily suspended but went back at the presuspension parity, followed by those that temporarily suspended but devalued, were in the middle.<sup>9</sup>

Credible adherence to a gold standard enabled the core countries of Western Europe to conduct monetary policy within the confines of the gold points, which served as a target zone within which the exchange rate was mean-reverting. These countries could violate the “rules of the game,” which in the strictest sense proscribed the use of monetary policy

for purposes other than defending convertibility.<sup>10</sup>

A case study of the wartime contingent rule in operation compares the wartime resumption experiences of the United States after the Civil War and the United Kingdom after World War I.<sup>11</sup> The U.S. return to gold lasted for six decades, while the U.K. return lasted for six years; further, output performance was strong in the U.S. case and anemic in the United Kingdom. The different outcomes do not reflect different strategies used to restore convertibility; rather, they describe the nature of the regimes after resumption. In the U.S. case, it was the credible classical gold standard; in the U.K. case, it was the flawed gold exchange standard.

A comparison of U.S. and Argentine inflation history in the nineteenth century suggests that the pattern of high and persistent inflation in Argentina from 1810 to 1867 versus the U.S. post-Revolutionary War pattern of a mean-reverting price level can be explained largely by the different constraints the two countries faced.<sup>12</sup> Argentina was subject to frequent wars and blockades; it faced a rising cost of external debt and high tax-collection costs and hence was unable to adhere to the gold standard rule. This constrained the country to use the inflation tax continually. In comparison, the United States, after instituting President Alexander Hamilton’s package of fiscal and financial reforms in 1790, successfully adhered to the gold standard and orthodox fiscal policy.

Finally, the gold standard’s good service may account for the growing use of gold as an international reserve asset in the nineteenth century. In the twentieth century, to economize on the use of ever-scarcer gold, the gold standard evolved into the gold exchange standard, which survived in different guises until 1971. So why do monetary authorities today persist in holding massive gold

reserves long after gold's official role in the international monetary system has been terminated? Evidence from equations describing the demand for international reserves explains this phenomenon by a combination of inertia, network externalities, remaining gold statutes, and high inflation in the 1970s.<sup>13</sup> However, the recent decline in inflation and the increasing international integration of financial markets augur the end of gold's importance in the international monetary system.

## The Great Depression

The Great Depression is the "defining moment" in U.S. economic policy in the twentieth century.<sup>14</sup> The depression is seen today as a consequence of the Federal Reserve's adherence to the flawed real-bills doctrine and to gold standard orthodoxy. It led policymakers to shun expansionary monetary policy, and it transmitted the U.S. depression across the globe. My research focuses on several of these themes.

### 1. CAUSES OF THE GREAT DEPRESSION

Debate continues over whether the depression was caused primarily by monetary or nonmonetary forces.<sup>15</sup> One line of research, based on a standard vector autoregression (VAR) model, decomposes shocks to the economy into permanent (supply) and transitory (demand), with a further division of the transitory shocks into monetary and other shocks.<sup>16</sup> My paper with Caroline M. Betts and Angela Redish complements the findings of Stephen G. Cecchetti and Georgios Karras, who propose that the beginning of the downturn in both the United States and Canada is explained by contractionary U.S. monetary policy, but that after 1931 a common supply shock, possibly credit disintermediation, was the dominant source of shock.<sup>17</sup>

### 2. PROPAGATION OF THE DEPRESSION

Debate also continues over whether the monetary shock impinged on the economy via nominal rigidities, the real interest rate, credit disintermediation, or debt deflation.<sup>18</sup> In my paper with Charles N. Evans and Christopher J. Erceg, evidence in favor of the sticky wage channel comes from simulations of a dynamic general equilibrium model of the U.S. economy which captures wage rigidity through Taylor overlapping-wage contracts.<sup>19</sup> The model does extremely well in capturing the main macroeconomic feature of the downturn. However, it predicts a much more rapid recovery than actually occurred. We explain this anomaly as the effect of the National Industrial Recovery Act of 1933. It imposed a fiat pattern of wage increases across the U.S. economy and prevented the normal adjustment mechanism of the labor market.

### 3. COUNTERFACTUAL POLICIES

The explanation by Milton Friedman and Anna J. Schwartz<sup>20</sup> for the Great Depression centers on the failure of the Federal Reserve to offset the banking panics. Two of my recent papers consider alternative monetary policy counterfactuals. The first simulates counterfactual stable monetary policy embodied in variants of Friedman's constant growth rate rule. Simulations based on a three-variable structural VAR model of the U.S. economy—assuming that the Fed held money growth to the interwar average and reacted to offset monetary shocks with a one-quarter lag—show, as do earlier findings by Bennett T. McCallum, that the depression would have been greatly attenuated.<sup>21</sup> The second paper considers whether the gold standard constraint would have prevented the Fed from attempting to offset the banking panics, as argued by Barry Eichengreen.<sup>22</sup> With a model that determines gold flows for the United

States as a large open economy with capital mobility and also accounts for the rest of the world, my paper with Ehsan U. Choudhri and Schwartz finds that Federal Reserve counterfactual expansionary monetary policy after the first banking panic in October 1930 hardly would have made a dent in U.S. gold reserves.<sup>23</sup> Had a similar policy been delayed until after the United Kingdom left the gold standard in September 1931, gold reserves would have declined markedly because of doubts that the United States would remain on gold, but the decline in reserves would not have breached the minimum statutory gold reserve ratio.

### 4. LEGACY OF THE GREAT DEPRESSION FOR THE INTERNATIONAL MONETARY SYSTEM

Eichengreen and I pose the counterfactual of a world in which the Great Depression had not happened but World War II and other political events did.<sup>24</sup> Simulations of a model of the international monetary system suggest that the interwar gold exchange standard with capital mobility would have survived into the mid-1950s and then would have collapsed into a managed float regime. Thus, the Great Depression had little impact on the evolution of the international monetary system.

<sup>1</sup> M. D. Bordo, "The Gold Standard, Bretton Woods, and Other Monetary Regimes: A Historical Appraisal," in *Dimensions of Monetary Policy: Essays in Honor of Anatole B. Balbach, special issue of Federal Reserve Bank of St. Louis Review (April–May 1993)*, pp. 123–91; Bordo and A. J. Schwartz, "Monetary Policy Regimes and Economic Performance: The Historical Period," NBER Working Paper No. 6201, September 1997; Bordo and L. Jonung, "A Return to the Convertibility Principle? Monetary and Fiscal Regimes in Historical Perspective: The International Evidence," in *Monetary Theory as a Basis for Monetary Policy*, Axel Leijonhufvud, ed. London: Macmillan, 1999.

<sup>2</sup> See B. Eichengreen, *Golden Fetters and the Great Depression, 1919–1939*. New

York: Oxford University Press, 1992.

<sup>3</sup> Bordo and Schwartz, "Monetary Policy Regimes and Economic Performance."

<sup>4</sup> Bordo, "The Gold Standard"; Bordo and Schwartz, "Monetary Policy Regimes and Economic Performance"; and T. Bayoumi and Eichengreen, "Economic Performance under Alternative Exchange Rate Regimes: Some Historical Evidence," in *The International Monetary System*, P. Kenen, F. Papadia, and F. Saccomani, eds. Cambridge and New York: Cambridge University Press, 1994. Evidence for the behavior of other macroeconomic variables under alternative monetary regimes also suggests that nominal interest rates performed differently, as theory would predict (the Fisher effect is harder to detect, and the expectations theory of the term structure is more robust) under convertible as compared with fiat regimes, and that the convertibility principle constrained both monetary and fiscal policy. See Bordo, "The Gold Standard"; Bordo and Schwartz, "Monetary Policy Regimes and Economic Performance"; and Bordo and Jonung, "A Return to the Convertibility Principle?"

<sup>5</sup> See Bordo, *The Gold Standard and Related Regimes: Collected Essays*. Cambridge and New York: Cambridge University Press, 1999.

<sup>6</sup> See Bordo and F. E. Kydland, "The Gold Standard as a Rule: An Essay in Exploration," *Explorations in Economic History*, 32 (October 1995), pp. 423–64, and NBER Reprint No. 2023, January 1996.

<sup>7</sup> See Bordo and Schwartz, "Monetary Policy Regimes and Economic Performance"; and M. Flandreau, J. LeCacheux, and F. Zumer, "Stability without a Pact? Lessons from the European Gold Standard, 1880–1914," *Economic Policy*, 21 (April 1998), pp. 115–62.

<sup>8</sup> See Bordo and H. Rockoff, "The Gold Standard as a 'Good Housekeeping Seal of Approval,'" *Journal of Economic History*, 56, no. 2 (June 1996), pp. 389–428, and NBER Reprint No. 2090, November 1996.

<sup>9</sup> A similar pattern is observed for the interwar gold exchange standard for

countries that borrowed in the New York capital market. See Bordo, M. Edelstein, and Rockoff, "Was Adherence to the Gold Standard a 'Good Housekeeping Seal of Approval' during the Interwar Period?," NBER Working Paper No. 7186, June 1999.

<sup>10</sup> See Bordo and R. MacDonald, "Violations of the 'Rules of the Game' and the Credibility of the Classical Gold Standard, 1880–1914," NBER Working Paper No. 6115, July 1997.

<sup>11</sup> See T. Bayoumi and Bordo, "Getting Pegged: Comparing the 1879 and 1928 Gold Resumptions," *Oxford Economic Papers*, 50 (January 1998), pp. 122–49, and NBER Reprint No. 2197, March 1999.

<sup>12</sup> See Bordo and C. Vegh, "What If Alexander Hamilton Had Been Argentinean? A Comparison of the Early Monetary Experiences of Argentina and the United States," NBER Working Paper No. 6662, December 1998.

<sup>13</sup> See Bordo and Eichengreen, "The Rise and Fall of a Barbarous Relic: The Role of Gold in the International Monetary System," NBER Working Paper No. 6436, March 1998.

<sup>14</sup> See Bordo, C. Goldin, and E. N. White, *The Defining Moment: The Great Depression and the American Economy in the Twentieth Century*. Chicago: University of Chicago Press, 1998.

<sup>15</sup> For a survey of earlier literature, see Bordo, "The Contribution of a Monetary History of the United States, 1817 to 1960 to Monetary History," in *Money, History, and International Finance: Essays in Honor of Anna J. Schwartz and M. D. Bordo*, pp. 15–70. Chicago: University of Chicago Press, 1989.

<sup>16</sup> See J. Gali, "How Well Does the ISLM Model Fit Postwar U.S. Data?," *Quarterly Journal of Economics*, 107 (1992), pp. 709–38; and S. G. Cecchetti and G. Karras, "Source of Output Fluctuations during the Interwar Period: Further Evidence on the Sources of the Great Depression," *Review of Economics and Statistics* 49 (March 1994), pp. 123–152.

<sup>17</sup> C. M. Betts, Bordo, and A. Redish, "A Small Open Economy in Depression: Les-

sons from Canada in the 1930s." *Canadian Journal of Economics*, 29, no. 4 (February 1996), pp. 1–36, and NBER Reprint No. 2098, December 1996.

<sup>18</sup> For surveys, see C. D. Romer "The Nation in Depression," *Journal of Economic Perspectives*, 2 (Spring 1993), pp. 19–39; and C. Calomiris, "Financial Factors in the Great Depression?," *Journal of Economic Perspectives*, 2 (Spring 1993), pp. 61–85.

<sup>19</sup> See Bordo, C. J. Erceg, and C. L. Evans, "Money, Sticky Wages, and the Great Depression," NBER Working Paper No. 6071, June 1997.

<sup>20</sup> M. Friedman and Schwartz, *A Monetary History of the United States, 1867 to 1960*. Princeton, N.J.: Princeton University Press, 1963.

<sup>21</sup> See Bordo, E. U. Choudhri, and Schwartz, "Could Stable Money Have Averted the Great Contraction?," *Economic Inquiry*, 33, no. 3 (July 1995), pp. 484–505, and NBER Reprint No. 2003, September 1995; and B. T. McCallum, "Could a Monetary Base Rule Have Prevented the Great Depression?," *Journal of Monetary Economics* (August 1990), pp. 3–26.

<sup>22</sup> Eichengreen, *Golden Fetters*. See also P. Temin, *Lessons from the Great Depression*. Cambridge, Mass.: MIT Press, 1989; and B. Bernanke, "The Macroeconomics of the Great Depression: A Comparative Approach," *Journal of Money, Credit, and Banking*, 27 (February 1995), pp. 1–28.

<sup>23</sup> Bordo, Choudhri, and Schwartz, "Was Expansionary Monetary Policy Feasible during the Great Contraction? An Examination of the Gold Standard Constraint," NBER Working Paper No. 7125, June 1999.

<sup>24</sup> Bordo and Eichengreen, "Implications of the Great Depression for the Development of the International Monetary System," in *The Defining Moment: The Great Depression and the American Economy in the Twentieth Century*, Bordo, C. Goldin, and E. N. White, eds., pp. 403–53. Chicago: University of Chicago Press, 1998.